PLANNING AND ESTABLISHMENT OF A NATIONAL INFORMATION SYSTEM FOR SCIENCE AND TECHNOLOGY (TANISSAT)

A Supplementary Project Report

for

Tanzania Commission for Science and Technology
Dar Es Salam
Tanzania

by

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Bangalore

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SECTION - I

PREFACE

INTRODUCTION

1. I was given a 3 weeks consultancy assignment by the International Development Research Centre (IDRC), Regional Office for Eastern and Southern Africa, Nairobi, Kenya, beginning from 26th August 1990 to 16th September 1990 to assist the Tanzania Commission for Science and Technology (COSTECH), Dar Es Salaam, in planning and setting up a national information system for science and technology.

2. On completion of the assignment, I had submitted a detailed report to IDRC during June 1991 in accordance with the terms and conditions of the consultancy assignment.

3. The consultancy contract had a provision in it for a second visit by the consultant during the terminal stages of the project.

TERMS OF REFERENCE OF THE SECOND CONSULTANCY ASSIGNMENT

4. Accordingly, I was invited by IDRC, Nairobi, through a consultancy contract no. Centre File No. 89-0317 dated 8.6.1993, to undertake this second visit to Dar Es Salaam for a period of 14 days during July-August 93 in order to review the progress of the project and also to advise COSTECH in related matters concerning the

implementation of the project as a whole.

ITINERARY

5. Under the terms of this consultancy contract, I left Bangalore on 17th July 1993 reaching Nairobi on 18 July via Bombay. I visited the offices of IDRC, in Nairobi, on 19th July, and met Ms.Jane Adawa and Dr. Cecil Blake for briefing on my assignment. I had also discussed with Dr. Blake details of my previous visit to Dar Es Salaam, explaining to him briefly about the scope and objectives of the project and the nature of work done by me.

6. I arrived in Dar Es Salaam from Nairobi on the night of 19th July 93 and commenced my consultancy work in COSTECH from 20th July 93.

DISCUSSIONS

7. I had the privilege of being received in a meeting by Dr. Y.M.Kohi, the Director General of COSTECH, and discussing with him in broad terms about the present status of project and details of work yet to be done.

8. I had also had daily meetings and interactions with the following senior officers of COSTECH who are directly associated with all aspects of planning and implementation of the project :

(i) Mr. T.E. Mlaki,
Director, Information and Documentation

(ii) Mr. H. Nguli, Principal Scientific Officer

(iii) Mr. E.Yonazi, Scientific Officer

(iv) Mr. A. Dachi, Computer Specialist

DETAILS OF THE WORK DONE DURING THE MISSION:

9. The details of the work done during my 2 weeks visit are highlighted below :

(i) Review of progress of the work on creation of S&T Databases.

The progress of the work done on the creation of the following S & T Databases was reviewed and discussed with the officers concerned in COSTECH :

(a) National Registry of Ongoing Research and Experimental Projects in Tanzania

(b) National Registry of Scientific Institutions in Tanzania.

(c) National Registry of Scientists and Technologists in Tanzania.

(ii) The completed survey instruments collected by COSTECH in respect of the above databases were checked, classified and indexed for publication in print form and also for input in a machine-readable form.

(iii) Advice was given on measures to be taken to collect data for the databases more comprehensively than what has been done upto July 1993.

(iv) The processing of data in the COSTECH Central Computer Centre was discussed and suggestions were given as necessary.

(v) The details of the organization and development of the COSTECH Library were discussed with the Librarian and other concerned personnel and a number of suggestions were given, as necessary.

(vi) Publication activities of COSTECH as part of TANISSAT (Tanzania National Information System for Science & Technology) were reviewed and suggestions regarding the TANISSAT Newsletter and TANISSAT Abstracts were given, as necessary.

(vii) Suggestions on further measures to be taken to accelerate the planning and development of TANISSAT were given (These are elaborated in more detail in this report).

(viii) Finally, a popular lecture on "National Information System for Science & Technology: General Considerations" was delivered on 29th July 1993 in the COSTECH Conference Hall for the benefit of all concerned officers and staff of the Commission.

ACKNOWLEDGEMENTS

10. At the outset, I must thank the Director and other authorities of the IDRC Regional Office, Nairobi, for inviting me to undertake this second consultancy assignment for COSTECH. I am thankful to Dr.Cecil Blake and Ms. Jane Adawa for all the arrangements made for my visit to IDRC offices and for briefing me on this mission.

11. To Dr. Yadon M. Kohi, the Director General of COSTECH, I owe my special thanks for the keen interest evinced by him in my assignment and in the suggestions made by me, and for providing me with all facilities during my visit and stay in Dar Es Salaam. I am grateful to him for the hospitality and courtesy shown to me during my visit.

12. I wish to thank Mr. Mlaki, Director, Information and Documentation, COSTECH, in assisting me in my task of reviewing of the progress of the project in great detail and in discussing with me details of further work to be done for the completion of the project.

13. In carrying out my assignment, I had to work very closely, on day to day basis, with Mr.Nguli, Principal Scientific Officer and Mr.E. Yonazi, Scientific Officer, who are actively associated with the project, and I wish to record my deep appreciation and gratitude for all the assistance rendered to me by both of them.

14. My thanks are also due to the Director of

Administration and Finance for providing me with all necessary facilities required for my work.

15. Finally, I have to thank all other officers and staff of COSTECH for all the help given to me.

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SECTION - II

BRIEF OUTLINES OF THE PROJECT

INTRODUCTION

1. A full description of the Project undertaken by COSTECH with funding by IDRC is given in my earlier consultancy report submitted to IDRC during June 1991.

Briefly outlined, the project seeks to set up a Tanzania National Information System for Science and Technology (TANISSAT) and, as a preliminary step, to create computer-based databases containing information in regard to the following components of the system considered as a vital and integral part of TANISSAT :

(i) National Registry of Ongoing Research and Experimental Projects in Tanzania.

(ii) National Registry of Scientific Institutions in Tanzania.

(iii) National Registry of Scientists and Technologists in Tanzania.

DIRECTORATE OF INFORMATION AND DOCUMENTATION

2. TANISSAT is being implemented by a full-fledged Directorate of Information and Documentation with a highly qualified and experienced information specialist as its head and a team of 3 supporting officers as project leaders and other necessary supporting staff.

ADVISORY COMMITTEE

3. The project proposal also envisages the constitution of an Advisory Committee to advise COSTECH on all aspects relating to the implementation of the project. This Advisory Committee was set up during 1990 and consists of 6 leading scientists, educationists and planners drawn from various organizations in Dar es Salaam, besides the Director of Information and Documentation as its Member-Secretary.

EQUIPMENT AND FACILITIES

4. Purchase of necessary computer systems, office equipment and other infrastructural facilities required for the project were also provided for as part of the project.

TRAINING OF PROJECT STAFF

5. The project proposal includes training of staff engaged in its implementation.

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SECTION - III

REVIEW OF THE PROGRESS OF WORK ON THE PROJECT

INTRODUCTION

1. During the intervening period between the first visit by the consultant during Aug-Sep 90 and the second one during July-Aug 93, there has been a remarkable progress in the conception and implementation of the project, although much work still remains to be done to complete the project in all aspects and make it operational and beneficial for the intended users.

2. All the necessary infrastructural facilities for setting up TANISSAT and for completing the projects envisaged in the IDRC-approved project document have been created.

ACCOMMODATION

3. The Commission has now moved into a large and spacious building of its own on the Bagamayo main national highway, a few kilometers from down town Dar Es Salaam, from its earlier rented buildings.

4. The Directorate of Information and Documentation has its own exclusive wing in this new building.

EQUIPMENT FACILITIES

5. There has also been good progress in augmenting the necessary equipment and other facilities required for the implementation of the project.

6. There are at present an appreciable number of computers- six to be exact, with necessary printing and other auxiliary equipment. What are still lacking are a heavy - duty photo-copying equipment and an off-set printing machine.

COMMUNICATION FACILITIES

7. Communication facilities in the form of telephones have also improved. However, the Commission does not, as yet, have telex and fax communication facilities which would, no doubt, become a stumbling block in the way of the speedy implementation of the project and the ultimate successful establishment of TANISSAT.

ON LINE INFORMATION ACCESS

8. It will be necessary for TANISSAT, in due course, to be able to access online international databases, such as the European Space Agency's Information Retrieval System (ESA/IRS) in Frascati, Rome, Italy, the DIALOG Information Retrieval System, Palo Alto, California, and other database hosts for information retrieval from more than 1,000 international databases covering millions of references to the universe of knowledge including those relating to the S & T activities in Tanzania for the benefit of Tanzanian users.

DATA COMMUNICATION NETWORK

9. In addition to the need for access to international databases online, TANISSAT may have the need, eventually, to allow its own databases that are now being created as part of the project accessible by users within the country.

10. TANISSAT may have to initiate a plan even from now on for the establishment of a Tanzanian national data communication network in consultation with the Tanzanian telecommunication authorities.

11. However, in the meantime, TANISSAT should consider the establishment of a high-speed PC-based terminal with a modem and a leased telephone circuit to the earth station which is stated to be very near to the Commission's offices, so that it can access any of the international database hosts (say, the ESA/IRS in Rome, which is the nearest to East Africa) for information retrieval and dissemination.

CD-ROM INFORMATION RETRIEVAL FACILITY.

12. The trends in information retrieval in these days are towards compact-disc-based read-only memory systems (CD-ROMs). Hundreds of CD-ROM databases in the fields of agricultural, medical, physical, environmental, engineering sciences, etc., are now available for in-house information retrieval and dissemination.

13. Since TANISSAT has a number of PCs and printers, all that is necessary to set up a CD-ROM information retrieval system will be the following:

a) CD-ROM Drive - 1 No. ..... $ 1,000

b) Initial Collection CD-ROM databases.....

i) AGRICOLA $825.00
(Agricultural Sciences)

ii) MEDLINE $2,475.00
(Medical Sciences)

iii) EI on-disc $2,145.00
(Engineering & Technology)

Details of specification for the CD-ROM drive and selected list of CD-ROM databases are given in Annexure-1 and 2 respectively.

14. Pending setting up online access facilities to international databases and an in-house CD-ROM information retrieval system as proposed above, TANISSAT may consider availing of such facilities from other countries like the United Kingdom, India, the United States of America and so on.

15. The Science Reference and Information Service of the British Library, 25, Southampton Buildings, London WC2A 1AW, has a number of CD-ROM databases.

16. An information analyst of TANISSAT may be attached to the Tanzanian High Commission in London with the sole purpose of accessing the online and CD-ROM information retrieval services provided by the British Library for the benefit of the Tanzanian users through TANISSAT.

17. TANISSAT will collect all queries for information on specific subject from Tanzanian users and send them by courier/telex/airmail to the information analyst in the Tanzanian High Commission in London for batch processing from the online/CD-ROM facilities in the British Library and transmission of the search results back to TANISSAT which will in turn service the users concerned.

18. Similar arrangements can also be made with the help of the Tanzanian High Commission, New Delhi, India, since a number of CD-ROM databases is available in Indian Information Centres like:

(i) Indian National Scientific Documentation Centre(INSDOC)
14, Satsang Vihar Marg,
Special Institutional Area,
NEW DELHI - 110 067.

(ii) National Informatics Centre,
CGO Complex, Lodi Road,
NEW DELHI - 110 003.

LIBRARY FACILITIES

19. It is gratifying to see about the progress achieved in setting up a Technical Library in support of the activities of TANISSAT.

20. During the earlier visit, the consultant noted that the Library was in a state of disorganization with no suitable accommodation in the rented premises or library shelves for keeping the books in a classified sequence and no facilities for the users to make use of the library collections.

21. In contrast to this earlier depressing situation, the Library presents now a totally different and pleasing picture in the new buildings of the Commission. The Library is housed in a separate, spacious and well designed wing in the ground floor of the new building, providing easy accessibility for the users from the main entrance. The books are properly shelved on metal shelves. Readers chairs, tables and other library furniture are being added in a phased manner. There is now a qualified and experienced librarian with a few supporting staff. The work of classifying and cataloguing the library collections is in progress. A database of the library's holdings is being created, using the computer facilities available.

22. I have incorporated a separate section in this report containing my suggestions on further augmenting the library collections and introducing many library services.

PROFESSIONAL STAFF

26. TANISSAT is implementing the project with a help of a team of professional staff consisting of the following:

(i) Director, Information & Documentation : 1
(Overall guidance and Co-ordination)

(ii) Principal Scientific Officer : 1
(Project Leader)

(iii) Senior Scientific Officer : 1
(Associate Project Leader)

(iv) Computer Specialist : 1
(for database creation and management)

(v) Scientific Editor : 1
(for information dissemination through Newsletter, Abstracts Bulletin etc.)

27. The professional staff is assisted by a number of other supporting staff like data entry operators and others.

TRAINING OF STAFF:

28. The project leader and his associate were deputed to India during 1990-91 for training in the National Informatics Centre, Government of India, New Delhi, for about six weeks. During 1993, they were also sent on tour to Bangkok to study information management in the Asian Institute of Technology.

29. It is considered necessary that the computer specialist be also sent on tour to any one of the following centres for advanced training in information processing and database management :-

(i) Science Reference and Information Service,
British Library,
25, Southampton Buildings,
LONDON WC2A 1AW
(under a British Council Scholarship)

(ii) Research Information Ltd.,
P.O. Box 45,
Reading, RG1 8HF
ENGLAND

(iii) Directorate-General of Information Management,
Commission of the European Economic Communities,
Batiment Jean Moment
Plateau de Luxemburg
LUXEMBURG (Grand Dutchy)
(under an EEC Scholarship)

(iv) National Informatics Centre,
Government of India,
CGO Complex, Lodi Road,
NEW DELHI - 110 003, India
(Under Indo-Tanzanian Bilateral cooperation)

(v) National Centre for Software Development,
Department of Electronics, Govt. of India,
C/o. Tata Institute of Fundamental Research
Homi Bhaba Road, Colaba
BOMBAY - 400 005, India

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SECTION - IV

DATA COLLECTION AND ANALYSIS

INTRODUCTION

1. Immediately after the formal commencement of the project, measures were taken to collect data for the creation of databases for the following :

   (i) National Registry of Ongoing Research and Experimental Projects in Tanzania

   (ii) National Registry of Scientific Institutions in Tanzania

   (iii) National Registry of Scientists and Technologists in Tanzania.

2. For the purpose of data collection, survey instruments for collecting and recording data for each of the above databases were designed and printed.

3. These surveys instruments were mailed to all concerned institutions and individuals for completion and return to the Commission.

4. It was suggested in the consultant's earlier report of 1991 that periodical meetings be convened by the Commission and selected representatives of the Tanzanian Institutions be invited to participate in these meetings, so that the goals and objectives of the project be explained to them and their cooperation

sought in collecting all relevant data required for building up the databases. Accordingly, a few meetings were held and one representative from each institution was nominated as the "Project Liaison Officer". The liaison officer was also rewarded with some incentives in order that he works hard and ensures the collection and recording of data pertaining to his institution.

5. In addition to holding such meetings and nominating liaison officers, TANISSAT Project officials had also visited a number of institutions to collect data by meeting individuals in the institutions.

BROAD ANALYSIS OF DATA COLLECTED

6. A broad analysis of the completed survey instruments received in the Commission after the intensive efforts taken for data collection, as mentioned above, discloses a disappointing trend.

7. As of 31 July 1993, the number of completed survey instruments received by the Commission for the different databases is as under :

(i) Data received for the National Registry of Ongoing Research and Experimental Projects in Tanzania. [54 data input sheets]

(ii) Data received for the National Registry of Scientific Institutions in Tanzania. [34 data input sheets]

(iii) Data received for the National Registry of Scientists and Technologists in Tanzania. [850 data input sheets]

8. The data received as above is woefully inadequate and falls far short of the actual number of ongoing research and experimental projects in progress, the number of S&T Institutions existing in the country and the large number of scientists and technologists working in these institutions.

EXTENDING THE COVERAGE OF DATA:

9. The consultant, during his meeting and discussions with the D.G. of COSTECH and the officers of TANISSAT, had stressed the need to aim at collecting full and comprehensive data for the databases, if such databases were to be meaningful and useful.

10. The consultant recommends that the following additional measures be taken to collect data as comprehensively as possible:

(i) Holding more meetings with the representatives of the institutions concerned to secure their cooperation for the successful completion of the project.

(ii) Increasing the number of contacts with the liaison officers and giving additional incentives to them, if necessary, to collect and record the data from more institutions and individual scientists and technologists.

(iii) Sending TANISSAT officials on more frequent visits to the institutions from whom responses were not received in order to persuade them to cooperate and furnish the necessary data.

(iv) These measures should be buttressed further by a personal appeal to all heads of institutions in the form of a"demi-official" circular from the Director - General of COSTECH and,if desirable, from the Honorable Minister for Science and Technology of the Tanzanian Government as well.

(v) Apart from these direct measures for data collection, several indirect methods for collecting the data may be considered :-

(a) With the cooperation of the disbursing officers for salaries, wages, grants etc., a check-list of all serving Tanzanian scientists and technologists could be prepared. Based on this check-list, contacts should be established with each individual scientist/technologist by direct contacts or by mail for getting the data input sheets completed.

(b) Many Tanzanian Institutions issue newsletters, abstract bulletins etc., (e.g., Sokine University of Agriculture). From these published sources, names of scientists / technologists should be noted down for subsequent contacts.

(c) Several ministries and departments of the Tanzanian Government including COSTECH have records communicating approvals and release of grants (including grants from foreign agencies) for ongoing

research and development projects. These sources should also be tapped to identify projects for inclusion in the database.

(d) In the earlier report of 1991, the consultant had recommended the appointment of full-time "data collectors" on an adhoc basis for the duration of the project. These data collectors should be sent on visits to institutions to meet individual scientist /technologist and also to collect data from publications and other indirect sources.

(e) COSTECH is bringing out a Newsletter and also an "Abstract Bulletin of Papers and Project Reports." A suitable announcement may be inserted in this and other publications and circulars of the Commission seeking the cooperation of all institutions and individuals in preparing and sending the required data to the Commission.

(f) Other measures that could be considered are : Release of a news item through local newspapers and a broadcast over the Tanzanian Radio.

11. It needs hardly any emphasis to state that it is absolutely imperative on the part of TANISSAT to collect the data as fully as possible, if the project for building the databases is to be successfully completed

to give the information and data that it is intended to give when it was originally conceived.

12. TANISSAT must make every effort to collect data from the remaining institutions and individuals by taking whatever measures that are considered necessary and by engaging the services of some more full-time staff for this purpose.

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SECTION - V

DATA PROCESSING

INTRODUCTION

1. Pending continuous and sustained measures proposed in the preceeding section to complete the process of data collection for creating the databases for the three national registries, the consultant had suggested, during his meeting and discussions with TANISSAT officers, that the data so far collected be organized and published in the form of printed directory-type publications in order to derive maximum benefit out of the efforts so far devoted to the project and to disseminate the available information.

2. This suggestion was readily agreed to and action was initiated to compile, print and distribute directory-type publications as follows, based on the data collected so far:

   (i) A Directory of Ongoing Research and Experimental Projects in Tanzania, Ist Edition, 1993-94.

   (ii) A Directory of S & T Institutions in Tanzania, Ist Edition, 1993-94.

   (iii) A Directory of Scientists and Technologists in Tanzania. I Edition, 1993-94.

3. During his work in the Commission, the consultant

had classified and indexed the data received for two directories mentioned in para 1(i) and (ii) above. Copies of his letters dated 26.07.1993 and 28.07.1993 forwarding the classified material to the Director of Information and Documentation for printing and publication are reproduced in Annexure 3 and 4 respectively.

4. As regards the Directory of Tanzanian Scientists and Technologists (para 1(iii) above), detailed guidelines for classification and indexing of the 850 data sheets so far received were given to the TANISSAT officers, as the consultant could not complete this work for lack of time during the short duration of his visit.

5. The suggestion made by the Consultant for printing of the directory-type publications was approved by the Commission.

COMPUTER PROCESSING AND DATABASE DESIGN:

6. The consultant had suggested that simultaneously with the printing and publication of the directories mentioned above, action might be taken to input the data received in the TANISSAT computer system for design and development of the databases, as envisaged in the original approved project documents.

7. After the databases are designed and created, they can be updated regularly as and when additional data is collected or received for input into the system.

8. Once this is done, it should be possible to produce

and print directory-type publications annually for wide distribution in the country.

9. This suggestion was accepted by TANISSAT and action had already been taken to input the data and create the databases.

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SECTION - VI

SCOPE AND OBJECTIVES OF TANISSAT AND ITS INFORMATION POLICY

INTRODUCTION

1. TANISSAT will function as the main national agency and apex body of the Government responsible for initiating, developing, strengthening, coordinating and monitoring all activities, programmes and policies relating to the collection, organization and dissemination of scientific and technical information and data for the country as a whole.

2. It will assist the Commission and the Government in the formulation and implementation of a long-term national information policy.

3. In order to speed up the establishment of TANISSAT, the Commission may set before itself a set of comprehensive objectives, as detailed below, towards which all activities, plans and programmes should be directed in a coordinated manner.

4. The objectives are divided into two categories : short-term objectives and long-term objectives. This is because, with the limited resources and trained man-power available, it would be too much to attempt working in all directions simultaneously. Therefore, it is proposed that the short-term objectives may be taken up for implementation within the next three years(1994 to

1996), leaving the long-term objectives to be implemented in the succeeding two years(1997-98) under a phased programme.

5. The details of the proposed short-term and long-term objectives are as under :

(i) **SHORT-TERM OBJECTIVES**

(a) Provide all the necessary basic and essential infrastructure facilities, including printing and reprography and audio - visual materials, within the existing budgetary support, and fresh funding, when available;

(b) Accelerate the development of the existing TANISSAT Library as a Central S&T Library and Information Centre to offer document procurement, inter-lending and other library services;

(c) Build up comprehensive collections of scientific and technical literature, relevant to national needs, by purchase, gift and exchange;

(d) Organize programmes for the education and training of skilled man-power through fellowships, apprenticeships, inter-national scholarships, etc;

(e) Undertake national surveys of existing S&T library collections, information facilities, manpower, etc for upgrading wherever necessary, and for their optimum

utilization;

(f) Complete the current project for creating databases of inventories of on-going R&D projects, S&T institutions, experts involved in R&D, and lists of specialized test facilities and equipment etc;

(g) Organize existing S & T document collections using computer-based information storage and retrieval techniques;

(h) Identify user needs for information and develop necessary techniques and services to satisfy such needs;

(i) Set up facilities for access to international databases and offer literature search services, current awareness services, etc., to the user; till then, avail of the off-line CD-ROM search facilities offered by other countries(i.e. Sweden, Denmark, India);

(j) Provide immediately a nation - wide document delivery service with back-up from national and international resources

(k) provide reference and referral services for the S&T community.

(ii) **LONG-TERM OBJECTIVES**

(a) Set up a national advanced training centre for information science and

technology with the support from international organizations;

(b) Design and develop data banks and data bases to reflect Tanzanian R&D activities and output of S&T literature;

(c) Promote the development of a data communication network with the cooperation of other concerned authorities and the Tanzanian Telecommunication Authority;

(d) Set up a library of patents,standards and trade literature;

(e) promote the indigenous production and distribution of S&T publications, R&D digests, newsletters, catalogues, directories etc;

(f) promote the use of information resources and services through audio-visual presentations, seminars,exhibitions, etc;

(g) Serve as a national focal point for promoting regional and international cooperation in library and information services; and

(h) accelerate the ongoing activities listed under the short-term objectives.

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SECTION - VII

ORGANIZATIONAL STRUCTURE OF TANISSAT

INTRODUCTION

1. TANISSAT, as it exists at present, can only be considered as a nucleus of the overall structure required for the planning and establishing of the proposed national information system for science and technology in a true sense of the term and its connotation.

2. Therefore, the existing organizational structure of TANISSAT needs to be developed further in a systematic manner considering the vast scope and functions of a national information system for science and technology.

3. An outline of the proposed structure for TANISSAT is given in Annexure 5.

4. This structure may be treated as a frame-work for the purpose of planning and development and the aim of the Commission may be to realize this frame-work over a period of the next five years or so under a phased programme.

DIRECTORATE OF TANISSAT

5. A Directorate of TANISSAT has already been set up as one of the Directorates in the Commission.

6. Mr.T.E. Mlaki, one of the senior-most and experienced information specialists in Tanzania, is holding charge of the post of the Director of TANISSAT.

7. As recommended in my earlier report, the Director of TANISSAT needs to be vested with both financial and administrative powers as considered necessary for the successful implementation of the project.

TANISSAT ADVISORY COMMITTEE

8. The TANISSAT Advisory Committee which was constituted during 1991 to advise the Commission on all matters relating to the planning and setting up the national information system may be involved more actively with TANISSAT's activities than at present. The strength of the Advisory Committee may also be increased suitably in order to ensure a proper quorum for its meetings and adequate representation for various subject disciplines.

MANPOWER REQUIREMENTS AND TRAINING

9. As already pointed out in my earlier consultancy report, the availability of adequate number of qualified and experienced information science and computer professionals will be the most critical requirement of the successful growth and development of TANISSAT.

10. One of the major problems faced in developing countries in planning national information systems is the difficulty in attracting persons of the right calibre to the profession.

11. The changing developments in information science and technology create a need for a cadre of individuals with analytical minds and creative thinking, and especially those who have background qualifications in science and technology. Scientists and engineers who have the necessary subject background will be more able, as a rule, to make information available in their concerned subject fields. It is, therefore, desirable to attract to this field of work persons who have had experience in scientific research and development work. To secure the best people, it is essential to ensure that they would have comparable career prospects to those they would have otherwise enjoyed in their original careers.

CREATION OF A CADRE FOR LIBRARY AND INFORMATION SCIENCE

12. It is recommended that a separate and distinct cadre for information specialists may be created in order to cater to the manpower needs, both immediate and long-term, of TANISSAT.

13. The cadre should be created with good salary scales, bright prospects for advancement in the career ladder, training opportunities etc., so as to attract the right kind of people who can make original contributions.

DETAILS OF THE PROPOSED CADRE

CADRE LEVELS

14. The cadre may consist of three levels as under :

(i) Group I level - Junior grade staff

(ii) Group II level - Supervisory grade professional staff

(iii) Group III level - Senior Officers (managing and directing)

STAFFING PATTERN

15. Within each group, there may be several grades, in a bottom-to-top order, as shown under :-

(i) **Group I level**

Group I (1)	Junior Assistant, Grade I (Entry level)
Group I (2)	Junior Assistant, Grade II
Group I (3)	Junior Assistant, Grade III

(ii) **Group II level**

Group II (1)	Senior Professional Assistant, Grade I (Entry level)
Group II (2)	Senior Professional Assistant, Grade II
Group II (3)	Senior Professional Assistant, Grade III

(iii) **Group III level**

Group III (1)	Scientific Officer, Grade I, (Entry level)
Group III (2)	Scientific Officer, Grade II
Group III (3)	Principal Scientific Officer, (Deputy Director)
Group III (4)	Director

RECRUITMENT PROCEDURES AND CAREER PROSPECTS

16. Recruitment of staff in Group I, II and III may be made normally at the entry level.

17. Recruitment to the entry level posts will be through competitive written examinations and practical tests.

18. The candidates who come out successfully in the examinations and tests will have to appear before a Selection Board for final selection and appointment.

19. Candidates selected at the entry level will go up in the career ladder to the next higher grade after completing the prescribed number of years(say, 5 years) in each level. At the end of the prescribed period, they will have to appear before a Selection Board which will screen and evaluate their work during the preceding

years on the basis of their evaluation reports and performance in the interview. This procedure will ensure the availability of promotional opportunities for the staff and keep their morale high.

20. Staff members who have acquired higher qualifications or undergone advanced training, after joining service, may be given accelerated or out-of-turn promotions. All encouragement should be given to the existing staff to acquire professional qualifications and/or to undergo advanced training in the form of scholarships, studentships, stipends, official deputations with pay and allowances etc.

21. Staff members who have done exceedingly good work or brought out publications of merit may be given advance increments in their existing salary scale.

22. In addition to the recruitment at the entry level, there may also be direct recruitment and appointment to posts at any level, depending upon the need and exigencies of the situation and in cases where persons with specialized qualifications and experience are required. However, this procedure may be resorted to in urgent and expectional cases only, as bringing in people from outside over the heads of those who are already in service, may tend to affect the morale of the existing staff. If such recruitment is made, the posts may be advertised publicly, so that serving members of staff can also have opportunities to compete for such posts on par with outside candidates.

DETAILS OF MAN-POWER REQUIREMENTS AND JOB DESCRIPTION

23. It is estimated that TANISSAT would need about 20 additional posts during the five year period (1994-1998), over and above the existing posts.

24. A break-up of these 20 additional posts is given below:-

(i)	TANISSAT Library and Information Centre	3 posts
(ii)	Information Processing and Database Management	4 posts
(iii)	Information Services Division	4 posts
(iv)	Training and Development Division	2 posts
(v)	Special Projects and Programmes Division	2 posts
(vi)	Administration, Finance & Secretarial Services	5 posts
	TOTAL	**20 posts**

25. The functional levels and positions of these additional posts are recommended as under :

TANISSAT LIBRARY & INFORMATION CENTRE

(i)	Scientific Officer, Grade I (Chief Librarian/Head of Division)	1 post

(ii)	Sr. Professional Assistant, Grade I (Acquisition & Technical Processing)	1 post
(iii)	Sr. Professional Assistant, Grade I (Library Services)	1 post
	TOTAL	**3 posts**

INFORMATION PROCESSING & DATABASE MANAGEMENT

(i)	Principal Scientific Officer (Head of Division)	1 post
(ii)	Scientific Officer,Grade II, (Database Systems)	1 post
(iii)	Scientific Officer, Grade II (Information Processing)	1 post
(vi)	Sr. Professional Assistant, (Information Analysis)	1 post
	TOTAL	**4 posts**

INFORMATION SERVICES DIVISION

(i)	Scientific Officer, Grade II (Head of Division)	1 post
(ii)	Scientific Officer, Grade I (Information Services - CD-ROM/ ONLINE/SDI)	1 post

(iii)	Sr. Professional Assistants (Information Dissemination -Printing & Publications)	2 posts
	TOTAL	**4 posts**

TRAINING & DEVELOPMENT

(i)	Scientific Officer, Grade I (Head of Division)	1 post
(ii)	Sr. Professional Assistant, Grade III (Training & Development)	1 post
	TOTAL	**2 posts**

SPECIAL PROJECTS AND PROGRAMMES

(i)	Scientific Officer, Grade I (Head of Division - Data Communication)	1 post
(ii)	Senior Professional Assistant Grade III	1 post
	TOTAL	**2 posts**

ADMINISTRATIONS, FINANCE & SECRETARIAL SERVICES

(i)	Purchase & Stores	1 post
(ii)	Administration	1 post

(iii)	Finance & Accounts	1 post
(iv)	Secretarial Services/Typing/ Correspondence	2 posts
	TOTAL	**5 posts**
	GRAND TOTAL	**20 POSTS**

TRAINING OF MANPOWER

26. At present, there is no institution to Tanzania to cater to the training and human resource development in the field of information systems and services. Most of the existing information specialists in Tanzania have had their training in institutions abroad.

27. Considering the present and future requirements for trained personnel in information in Tanzania in general and in TANISSAT in particular, the existing situation is far from satisfactory.

28. In view of the above, the establishment of a training centre in TANISSAT for imparting training in modern information handling techniques and computer-based information systems is strongly recommended.

29. It is also recommended that the University of Dar Es Salaam may be persuaded to establish and run a separate Department of Information Studies to train fresh young graduates in all aspects of the collection, organization, storage, retrieval and dissemination of information.

30. Till such time, as these proposals are implemented, it is considered necessary that a few selected personnel at present working in TANISSAT e.g. the computer programmer, the Library Incharge etc. may be considered for deputation for training in selected institutions abroad under any bilateral fellowship programmes.

31. It is also recommended that atleast 5 new posts for TANISSAT out of 20 posts recommended over the next 5 years be recruited during 1994 and deputed abroad for training.

32. Some of the foreign institutions to which the selected persons could be sent for training are as under:-

(i) School of Librarianship and
Information Studies,
Ladbroke House
Highbury Grove, London N52AD

(ii) School of Information Science
City University
Northampton Square
London, England ECIV OHB

(iii) School of Library and Information Studies
Queen's University of Belfast
Belfast, Northern Ireland.

(iv) School of Library and Information Studies
Loughborough University of Technology,
Loughborough, England

(v) College of Librarianship
University College of Wales
P.O.Box 2, Aberystwyth,
Wales SY 23, England

(vi) Indian National Scientific and
Documentation Centre, (INSDOC)
Special Institutional Area,
New Delhi 110 067, India

(vii) Indian Statistical Research Institute,
Documentation Research and Training Centre,
8th Mile, Mysore Road,
R.V.Engineering College Post,
Bangalore 560 058, India

(viii) Patrice Lumumba University
7,UL ORDZH ONIKIDZF
Moscow

(ix) Ecole Nationale Superieure des
Bibliotheques
17-21 Boulevard du 11-Novembre 1918
69100 Villeurbanne
France

33. In the United States of America, more than 70 universities offer courses of instruction in library and information science.

34. It is recommended that the following publications which give details of courses available in library and information science may be obtained for guidance and selection :

(i) World of Learning
R R Bowker & Co.

(ii) Commonwealth Universities Year Book
Association of Commonwealth Universities
John Foster House,
36, Gordon Square
London, WCIH OPH, England

(iii) Graduates and Professional Programs
Peterson's Guides
Dept. 5631, P.O. Box 2123
Princeton, New Jersey 08540-0008
United States of America

35. The University of Dar Es Salaam may be requested to start from the new academic term an one-year evening post-graduate Bachelor's Degree Course in Library and Information Science, so that persons already working in TANISSAT and other libraries can attend and benefit from this evening course. For this purpose, grants may be given to the university to strengthen their faculty, text-book collections and other facilities.

36. The international organizations in Addis Ababa which have their own library and documentation centres, such as, ILCA and PADIS, may be requested to accept fresh or serving library science diploma holders as apprentices for practical training in their respective libraries and documentation centres. A suitable stipend for the selected apprentices may be paid by TANISSAT.

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SECTION - VIII

INFORMATION GENERATION AND DOCUMENTATION

INTRODUCTION

1. One of the important activities of TANISSAT in the coming years should be to monitor, acquire and process information that is generated in various S&T organizations, R&D centres etc. in Tanzania.

2. There is no doubt that most S&T organizations in Tanzania will be generating a lot of information arising from their research and developmental activities. However, the unfortunate situation in many developing countries is that the R&D information that is generated within the country is NOT properly documented either in print form or in machine readable form.

3. TANISSAT must play a catalystic role in encouraging not only the generation of information by sponsoring and funding projects, surveys, consultancies etc. but also in documenting and publishing the information that is generated.

4. The steps that are recommended in monitoring, capturing and documenting internally generated information in Tanzania are described in the succeeding paras.

ANNUAL REPORTS

5. All S&T organizations in Tanzania should be directed through a circular or gazette notification by the Ministry of Science and Technology to bring out and publish Annual Reports regularly and deposit a copy of the Annual Report with TANISSAT, besides in other depository centres in the country.

REGISTRATION OF PROJECTS

6. There is already a rule that is in practice in Tanzania under which all new projects are to be compulsorily registered with the Commission.

7. A National Registry of Ongoing Research and Development Projects is also being maintained as part of the IDRC-funded project.

8. This National Registry should be further strengthened and continuously updated on the lines of the "SCIENCE INFORMATION EXCHANGE" that was operated by the Smithsonian Institution, Washington D.C., U.S.A. I am not aware of the present status of this Science Information Exchange. TANISSAT may perhaps obtain latest information from the Smithsonian Institution through the American Embassy in Dar Es Salaam.

PROJECT REPORTS

9. In the United States, many fund-giving Agencies like NASA, the Department of Defence, the Department of Energy etc. insist on getting periodical progress

reports on projects approved and funded by them. On completion of the project, a final project report is also to be issued.

10. TANISSAT and the Commission may consider introducing a system of project reporting by all S&T organizations in the country that receive grants-in-aid for projects from whatever sources of funding similar to the practice followed in several other countries.

11. The nomenclature of project reports to be issued may be similar to the following:

(i) **TM - (TECHNICAL MEMORANDUM)**

Project Reports that need to be circulated within the institution concerned or within the country.

(ii) **TN - (TECHNICAL NOTE)**

Project Reports that are considered suitable for circulation within the country and outside.

(iii) **TT - (TECHNICAL TRANSLATIONS)**

Reports that are in the nature of translations from foreign languages e.g. Russian, German, French etc. into English or in local languages.

(iv) **CR - (CONTRACTORS/CONSULTANTS REPORT)**

When a project is executed by a contracting

organization or or by a consultant for and on behalf of an institution, the resultant report may be treated as a contractor's / consultant's report.

(v) **CP - (CONFERENCE PROCEEDINGS)**

The papers presented in conferences held in the country may be brought together and issued under the category of conference proceedings.

(vi) **SAR - (STATE-OF-THE-ART REPORTS)**

TANISAT may commission preparation of "state-of-art" reports which will be a general survey covering any theme of vital interest to the country through experts, consultants etc. Such reports are to be distinguished as such and may be issued under this category.

REPRINTS OF PAPERS

12. It will be necessary for TANISSAT to maintain a comprehensive and upto date collection of reprints of scientific and technical papers submitted by Tanzanian scientists for publication in national and international scholarly and professional journals. Attempts may be made to secure atleast a copy of the papers from all Tanzanian scientists to constitute the nucleus of the reprints collection. The scientists should be requested that whenever they submit a research paper for publication, a copy should be sent to TANISSAT automatically as a matter of routine practice to strengthen and update the reprints collection.

TANISSAT may consider bringing out an annual publication under the title of "TANZANIAN ABSTRACTS"

REPRINTS OF PAPERS ON TANZANIAN S&T PUBLISHED BY FOREIGN SCIENTISTS

13. It is now possible to get a print-out of papers published by Tanzanians working abroad and non-Tanzanian authors on subjects relating to S&T activities in Tanzania from several CD-ROM databases (Please see list in Annexure no.2). The assistance from foreign CD-ROM information retrieval centres may be sought in this regard. Once the print-outs are received, copies of the papers may be obtained free of cost directly from the authors concerned or from the following Document Delivery Centres :-

(i) The British Library,
Document Supply Centre
Boston Spa, Wetherby, York, England

(ii) The Photocopy Division
Library of Congress
Washington D.C.
U.S.A.

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SECTION - IX

INFORMATION ACQUISITION AND ORGANIZATION

INTRODUCTION

1. As already suggested in the previous section, the existing Library of the Commission should be developed as TANISSAT Technical Library and Information Centre on high priority, because it is on the strength of this Centre, its document collections and its services that the National Information System for Science and Technology can be successfully established.

2. For the development of the Technical Library and Information Centre, the following measures are considered necessary :

STRENGTHENING OF STAFF

3. As stated in the previous section on manpower requirements and training, there is an urgent need to strengthen the existing staff for the Technical Library and Information Centre. To begin with, a Chief Librarian and Information Officer in the grade of a Scientific Officer may be appointed immediately to plan, organize and develop the existing Library as the TANISSAT Technical Library and Information Centre. Two more posts should be created over the next four years to run this unit of TANISSAT smoothly and efficiently.

COLLECTION DEVELOPMENT

4. The existing document collection is considered inadequate to provide essential library and information services and to fulfill the goals and objectives of TANISSAT. I have found that most of the existing publications are quite old and out of date. For want of funds, no new publications have been added. I recommend that the document collection may be augmented by atleast 500 documents annually, so that, at the end of five years, the Library and Information Centre would have a total collection of more than 10,000 active and live documents.

5. Similarly, the number of science and technology journals should be increased to atleast 100 current titles, if not more. In this connection , I wish to stress that current journals are the primary sources of latest information and scientists and technologists depend very heavily on these journals to keep themselves abreast of developments in their fields of activities. Studies carried out elsewhere indicate that an active scientist needs to browse through atleast 20 journals in his field of activities involving about 15 hours of reading time every week, if he has to post himself upto date about current developments in his field. There are about 7,000 international professional and scholarly journals which are widely consulted and quoted by scientists in their own publications. These journals cover the entire spectrum of science and technology including agricultural, biological and life sciences, physical, chemical and earth sciences, engineering, technology and applied sciences and so on.

6. For a national information system for science and

technology to be meaningful, it should get atleast about 500 titles covering the above subject fields. However, I have proposed a very modest subscription of only 100 selected titles, so that TANISSAT could produce and distribute a local "current contents" publication containing the titles of articles appearing in these 100 journal titles. If any user wants to have the full-length paper after browsing through the "current contents", a photocopy of the required paper could be supplied to him by the Technical Library and Information Centre.

RESOURCE SHARING

7. In order to avoid costly duplication in purchase of books, journals etc., a cooperative acquisition policy may be entered into by TANISSAT with other major libraries in Dar Es Salaam, such as, the Dar Es Salaam University Library, so that atleast one copy of all significant publications in science and technology is available in a local information network.

ROLE OF TANISSAT TECHNICAL LIBRARY & INFORMATION CENTRE

8. The TANISSAT Technical Library and Information Centre should serve as the National S&T Library and Information Centre supplementing the collections in other S&T Libraries in the country and specialize in the following type of publications :

(i) Research level books and monographs

(ii) Proceedings of international conferences on subjects of relevance to Tanzania

(iii) Technical reports

(iv) Publications of UN Agencies

(v) Publications obtained under exchange programmes from counterpart organizations and agencies in other countries with which TANZANIA has bilateral agreements for cooperation and information exchange.

(vi) Trade literature (available free of cost from manufacturers)

(vii) Audio-visual materials

ACQUISITION METHODS FOR COLLECTION DEVELOPMENT

Acquisition by purchase

9. The selection of documents for purchase is to be done primarily by the staff of TANISSAT. However, all the technical staff members of the Commission and those working in other S&T institutions may be encouraged to make suggestions for purchase of documents. For this purpose, suggestions slips(Annexure 6) for purchase of documents may be freely distributed to all concerned sections and divisions in the Commission and other S&T institutions.

10. Catalogues of important publishers should be obtained and circulated to all professional scientists and engineers for selection of suitable titles of publications.

11. A few selection tools, such as the following, may be subscribed for development of document collections:

(i) "New Technical Books"
New York Public Library,
5th Avenue & 42nd Street,
NEW YORK 110 018, USA

(ii) "Book Review Index"
Gale Research International,
835, Penobscott Building,
DETROIT, MI 48226-4096

(iii) "American Book Publishing Record",
R.R. Bowker
121, Chanlon Road, New Providence,
NJ 07974, NEW JERSEY, U.S.A.

(iv) "British Book News"
Basil Blackwell Ltd.,
108, Cowley Road,
Oxford OX4 1JF, ENGLAND

(v) "Index to Conference Proceedings
Received in the British Library"
British Library, Document Supply Centre,
Boston Spa, Wetherby, York, England

(vi) Accession Lists of leading Libraries and Information Centres in Africa, Asia, USA, UK etc.
(To be selected from the "World of Learning" Handbook)

12. The British Council Library in Dar Es Salaam has excellent selection tools, catalogues and sources of

information and these may be consulted for document selection.

13. The British Council also offers for sale the "overseas photocopy coupons" which might be purchased for ordering and getting photocopies of articles published in over 50,000 international journals and of papers presented in any international conference from the British Library Document Supply Centre at the address mentioned in para 11(v) above.

ACQUISITION BY GIFT

14. It is sometimes possible to get gifts of books and other publications under many international assistance programmes of several organizations, libraries and governmental agencies, as detailed below :

(i) The Overseas Development Association, UK (through British Council)

(ii) US Agency for International Development (through the US Embassy in Dar Es Salaam)

(iii) Gifts and Exchange Division of the Library of Congress, Washington DC, USA

Governments of many other countries have schemes to gift books to developing countries (e.g. Canada, Australia, India etc.). The possibilities may be explored.

ACQUISITION BY EXCHANGE

15. This is the easiest method for libraries in developing countries to build up large document collections free of cost.

16. Most of the Universities, R&D Centres, Governmental Agencies, etc. in many countries are willing to offer their publications, particularly, technical reports, reprints of papers published in journals etc. free of cost in exchange. They may be willing to do so, even if TANISSAT does not have many publications to offer in exchange.

17. Therefore, immediate steps should be taken to organize a publications exchange programme. For this purpose, a list of organizations to be approached for supplying their publications should be compiled based on the following sources :

(i) "Research Centres Directory",
Gales Research International,
835, Penobscott Building,
DETROIT, MI 48226-4096

(ii) "World of Learning"
Taylor & Francis
1900, Frost Road, Suite 101,
Bristol, PA 19007-1598, USA

(iii) "Europa Year Book"
Gale Research International
835, Penobscott Building,
DETROIT, MI 48226-4096
U.S.A.

(iv) Directory of R&D Institutions in India
CSIR, Rafi Marg, New Delhi 110 001, India

18. After compiling a list of selected organizations to be approached for getting their publications, a standard "document request form" (Annexure 7) may be issued to each organization.

19. Some of the organizations which are likely to respond to requests for sending their publications free of cost are:

(i) National Research Council of Canada,
Ottawa, ONK K1A 026, Canada

(ii) Commonwealth Scientific and Industrial
Research Organization
P.O. Box 225, Dickson, ACT 2602,
Australia

(iii) National Laboratories of the Council of
Scientific & Industrial Research,
Rafi Marg,
New Delhi 110 001
(There are about 40 laboratories under CSIR and the request has to be sent to individual laboratories)

(iv) The Science and Engineering Research Council
Polaris House, North Star Avenue,
Swindon, Wilts,
England

(v) The Technology University of Delft
Delft, Netherlands

(vi) The Royal Institute of Technology
S-100, Stockholm, 44 Sweden

(vii) The Directorate-General of Information Management
Commission of the European Economic Communities,
Batiment Jean Monnet,
Plateau De Kirchberg,
Luxembourg, Grand Dutchy

(viii) Publications Divisions of U.N. Agencies

(ix) National Libraries and Document Exchange Centres in various countries (as listed in UNESCO Bulletins and Publications)

ORGANIZATION OF DOCUMENT COLLECTIONS

(i) ***Book and Monographs***

20. The existing systems and procedures for classification and indexing of the documents may be continued.

(ii) ***Journals***

21. It was noted that many issues of journals are shelved without binding. It is suggested that these journal issues be bound and the bound volumes be shelved alphabetically by titles.

(iii) ***Reprints***

23. Reprints of journal articles may be shelved under the names of the authors in pamphlet boxes.

(iv) ***Technical Reports***

24. Reports of all types having a document number and/or the name of the issuing organization may be shelved in pamphlet boxes under the names of the issuing organizations concerned in an alphabetical sequence and, within each organization, by document number in an ascending order sequence.

The reports may be indexed by

(i) by the name of the personal author
(ii) by the name of the issuing organization
(iii) by document number
(iv) by subject-headings

(keywords are to be taken from UDC schedules or from Thesauri)

LIBRARY SERVICES

25. The following library services may be introduced as soon as possible:

(i) LIBRARY MEMBERSHIP

26. All bonafide and eligible users in COSTECH and other S&T Institutions may be freely allowed in the Library for purpose of browsing, reference and consultation.

27. Users who wish to have borrowing privileges should be required to fill in an application for membership in the Library in the prescribed form (Annexure 8) and submit to TANISSAT through the respective Heads of Departments/ Institutions. Users who are admitted as members of the library may be issued with borrowers cards in a graded scale depending upon the rank and position of the user.

28. Detailed rules and regulations for the use of the resources and services of the library should be framed.

(ii) **ACCESSION LISTS OF PUBLICATIONS**

29. By cooperation with other S&T Libraries in Dar Es Salaam and outside, a combined accession list of publications currently added to the collections in these libraries may be issued monthly or quarterly basis.

(iii) **INTER LIBRARY SERVICES**

30. Again, in cooperation with all other S&T libraries in Dar Es Salaam area, an inter-library service for loan and photocopying of documents may be introduced. The service may cover :

(a) loan of books and reports (except current issues and bound volumes of journals)

(b) photocopying of articles from journals and bound volumes

(c) exchange of unpriced publications.

(d) resource sharing including reprographic, photographic, translation and other facilities.

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SECTION - X

INFORMATION STORAGE AND RETRIEVAL

INTRODUCTION

1. Under the IDRC-approved Project, TANISSAT has already taken action to create the following data-bases for organization, storage and retrieval of information, as indicated in the previous sections of this report:-

   (i) A National Registry of S&T Institution in Tanzania

   (ii) A National Registry of ongoing Research and Experimental Projects in Tanzania

   (iii) A National Registry of Scientists and Technologists in Tanzania

   My previous Report of June '91 deals extensively with the creation of these databases.

DATABASE OF SCIENTIFIC INSTRUMENTS

2. In addition to the above, a National Registry of Scientific Instruments and Special Facilities available in Tanzanian S&T institutions has been proposed. However, data collection for this project is still in progress and it might take some more time for this database to be created.

DATABASE OF SCIENTIFIC PUBLICATIONS

3. Besides these databases, TANISSAT may consider creating a database for a National Registry of S&T Publications to cover the existing publications held in COSTECH and in various other Ministries, Departments, Parastatal Organizations, Academic Institutions, R&D Laboratories, etc. Once the database covering the existing collections is created, it should be possible to issue a "TANZANIAN S&T ACQUISITIONS" representing the monthly intake of indigenous and foreign publications by all the institutions concerned.

A publication of this nature will be highly useful providing access to a large number of publications for Tanzanian Scientists and technologists. The publication will promote greater utilization of the publications by the users through inter-institutional lending and photocopying.

This database can be created by TANISSAT with existing infrastructure facilities in terms of personnel, equipment etc.

As regards retrieval software for use with this database, the CD/IDIS Library and Information Retrieval Software which is developed by UNESCO, Paris, and which is highly suitable for a database of this nature may be considered.

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SECTION - XI

INFORMATION DISSEMINATION

INTRODUCTION

1. Information per se has no tangible value unless it is widely disseminated. The very purpose of collecting, organizing and storing information is to disseminate it as widely as possible and through whatever media that are available. Therefore, one of the main functions of TANISSAT should be to disseminate information that is acquired and processed by it to the entire S&T community in the country.

INFORMATION DISSEMINATION METHODS

2. There are several methods for disseminating information and TANISSAT may consider some of the following :

(i) ***TANISSAT NEWSLETTER***

3. A newsletter is being issued already covering various activities of the Commission. This effort is very commendable and it is hoped that the newsletter will be issued regularly and covers not only the activities of the Commission but also the general S&T activities in the country.

(ii) ***TANZANIA ABSTRACTS***

4. TANISSAT is also bringing out an annual publication containing abstracts of S&T

publications issued by the Commission.

5. This scope and coverage of this abstracting publication may be enlarged eventually to cover all the S&T publications issued by the Ministries, Departments, para-statal organizations, consultants and various other R&D Laboratories in the country.

(iii) ***TECHNICAL REPORTS***

6. It is recommended that TANISSAT may consider setting up a Publications Section fully equipped with photographic and reprographic facilities in order to take up an active publication activity. This section will be expected to commission state of art reports, trend reports and analytical reports by experts on subject of vital interest to the growth and development of R&D activities in the country.

(iv) ***AUDIO-VISUAL MATERIALS***

7. Audio-visual materials constitute an effective means of information dissemination for research, education and training.

TANISSAT should consider setting up a separate Audio-Visual section having

(a) Audio-tape books
(b) Audio-tape lectures
(c) Video cassettes
(d) Motion films

8. Several organizations like the British Council,

the Canadian Film Institute, the U.S. Information and Communication Agency etc. offer a loan service for audio-visual materials and this service should be taken advantage of.

TANISSAT may arrange monthly screening of films and videocassettes and invite all S&T personnel to such shows.

(v) ***LITERATURE SEARCH SERVICE***

9. As suggested in the previous section of this report, a service for information access and retrieval from CD-ROM databases available in some information service centres abroad may be introduced as soon as formal cooperative arrangements with the foreign centres are finalized. Such a service would be a great boon to Tanzanian scientists and engineers.

As soon as feasible, a project for setting up a high speed terminal facility to access online the international databases available through the Information Retrieval System of the European Space Agency in Frascati, Rome, Italy, may be taken up for approval and implementation.

(vi) ***CIRCULATION OF CURRENT CONTENTS OF JOURNALS***

10. It is recommended that the following current awareness publications issued by the Institute of Scientific Information(ISI), 3501, Market Street, Philadelphia PA 19104, USA, may be subscribed to immediately.

(i) CURRENT CONTENTS-Engineering, Technology and Applied Sciences

(Weekly)

(ii) CURRENT CONTENTS-Physical, Chemical and Earth Sciences
(Weekly)

(iii) CURRENT CONTENTS-Agriculture, Biological and Life Sciences
(Weekly)

11. These weekly publications (which are also available on searchable floppy diskettes) reproduce photographically contents pages of more than 1000 international journals in each of the above subject fields even before the formal publication and distribution of the journals themselves. As soon as these "Current Contents" weeklies are received, TANISSAT should take photocopies of selected contents pages of journals pertaining to a specific subject and then circulate the copies to the users working in the concerned subject fields.

12. With an investment only on 3 weeklies as above costing in all about US$ 2,000/- per annum, a nation-wide SDI(Selective Dissemination of Information) can be introduced benefiting a large number of users.

LECTURE SERIES

13. Under various international and bilateral programmes in the field of science and technology, a number of experts, consultants etc. visit Tanzania throughout the year.

14. The presence of such specialists in the country should be taken advantage of and they may be invited by the Commission to deliver a series of lectures under the auspices of the Commission.

15. In addition to the visiting foreign specialists, leading Tanzanian scientists and experts may also be invited to deliver the lectures periodically.

16. The lecture series may be considered as one of the important features of the information dissemination activities of TANISSAT.

S & T JOURNALS

17. The long-term goal of TANISSAT should be the establishment of a National Science Press entrusted with the responsibility of bringing out Tanzanian national scientific and technical journals, books and monographs, technical reports etc. in various S&T fields for information dissemination.

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ANNEXURES

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ANNEXURE-I

CD-ROM DRIVE DETAILS

1) *TCDR-7000*

A rugged external CD-ROM Drive from Todd Enterprises Inc. It is built around a Hitachi internal drive with many add-on features from Todd. Some of the features of this heavy duty multimedia CD-ROM drive are :

[*] **H**eavy duty motor

[*] **K**eylock for security of CD-ROM databases

[*] **A**utomatic lens cleaning

[*] **S**mall footprint

[*] **O**perational in horizontal as well as vertical positions

[*] **D**aisy-chaining capability where upto 8 drives can be interlinked with a single interface card.

[*] 64K Buffer

[*] **K**odak Photo CD compatibility

[*] **F**astest access time (274 msec)

This is an ideal drive for libraries where security of costly CD-ROM database is a concern. Once in locked position, CD disk can not be removed without the key. With its heavy-duty motor and patented automatic lens cleaning system, the drive will provide years of trouble free service. Mean time between failures (MTBF) is over 50,000 hours.

Configuration

CD-ROM external drive, interface card, cable, MSCDEX and other software.

Cost :- US $ 1,500 (approx)

2. *VENTURER*

Advanced research in CD-ROM technology has brought about this low cost yet reliable drive. Venturer is fully capable of playing multimedia presentation (Audio, Video, graphic). Moreover, the drive is capable of playing music from any standard Audio CD.

Through a proprietary parallel port interface, it can be hooked to the parallel port of any PC making it a shuttle. In short, this drive gives you features not available in other drives at an unbelievable cost !

EXTERNAL DRIVE

Feature:

* Portable Slim case or "CUBE"
* "Top loading" mechanism
* Parallel port or proprietary interface
* Microsoft MS-DOS CD Extension
* Multimedia applications compliant
* Full feature Audio playback control panel
* ISO 9660 format/High sierra standard
* Fully compatible with CD-ROM mode 1, mode 2 and CD Audio disc
* 150K Bytes/sec data transfer rate
* 2352 Bytes buffer
* 800 msec Average Access Time

Cost :- US$ 1,000 (approximate)

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ANNEXURE-II

CD-ROM DATABASES

ON

ENGINEERING, TECHNOLOGY & APPLIED SCIENCES

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01. Applied Science & Technology Index
02. Biotechnology Abstracts
03. CABCD
04. Concise Engineering and Technology Index
05. FSTA
06. MathSci Disc
07. NTIS on Silverplatter
08. SIGLE
09. The OCLC Computer Library

CD-ROM DATABASES

ON

PHYSICAL, CHEMICAL AND EARTH SCIENCES

---

01. Analytical Abstracts
02. Applied Science & Technology Index
03. CHEM-BANK
04. ClinPSYC
05. Concise Engineering and Technology Index
06. Earth Sciences Disc
07. EINECS Plus-CD
08. FSTA
09. Georef
10. IARCancer Disc
11. INIS (International Nuclear Information System)
12. NTIS on Silverplatter
13. OSH-UK
14. PolTox II: EMBASE
15. PolTox III: CAB
16. Social Sciences Index
17. TOXLINE on Silverplatter
18. WATERLIT

CD-ROM DATABASES

ON

COMPUTER SCIENCES

---

01. Applied Science & Technology Index

02. Concise Engineering and Technology Index

03. MathSci Disc

04. The OCLC Computer Library

CD-ROM DATABASES

ON

AGRICULTURE

---

01. AGRICOLA on Silverplatter
02. AGRIS
03. Biological & Agricultural Index
04. Compact International Agriculture Research Library, Basic Retrospective Set 1962-86 (CIARL BRS)
05. Human Nutrition
06. PEST-BANK
07. PolTox I: NLM, CSA, IFIS

CD-ROM DATABASES

ON

LIFE SCIENCES

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01. AGRICOLA on Silverplatter
02. Biological Abstracts on Compact Disc
03. Biological Abstracts/RRM on Compact Disc
04. Life Sciences Collection
05. NTIS on Silverplatter
06. Zoological Record on Compact Disc

CD-ROM DATABASES

ON

FOOD SCIENCE TECHNOLOGY

---

01. Food & Human Nutrition
02. Foods Intelligence on CD
03. FSTA
04. Human Nutrition
05. PolTox I: NLM, CSA, IFIS
06. PolTox II : CAB

CD-ROM DATABASES

ON

DRUGS & PHARMACEUTICALS

---

01. Drug Information Full-Text
02. Excerpta Medica CD: Drugs & Pharmacology
03. International Pharmaceutical Abstracts (IPA)
04. Meyler's Side Effects of Drugs (SEDBASE)
05. PolTox II: EMBASE
06. USP DI Volume I, Drug Information for Health Care Professional
07. USP DI Volume II, Advice for the Patient

CD-ROM DATABASES

ON

MEDICAL SCIENCES

---

01. ADONIS
02. AIDSLINE
03. Biological Abstracts on Compact Disc
04. CANCER-CD
05. Drug Information Full-Text
06. International Pharmaceutical Abstracts(IPA)
07. Medline Express
08. Medline Standard
09. New England Journal of Medicine (ENJM)
10. Nursing & Allied Health (CINAHL)-CD
11. Physician's Desk Reference
12. TOXLINE on Silverplatter

ANNEXURE-III

M.N. SEETHARAMAN
IDRC Consultant

Dar Es Salaam
26.7.1993

The Director (Documentation)
COSTECH,
Dar es Salaam

Sir,

Sub: **DIRECTORY OF ONGOING RESEARCH AND EXPERIMENTAL PROJECTS IN TANZANAI**

As per our discussions on 23rd July, 1993, I am enclosing 54 input sheets relating to the ongoing research and experimental projects in Tanzania for editing and publishing as a Directory. The projects have been broadly classified in a subject fields.

The following supporting documents are also provided:-

(i) An Introduction on the organization of the Directory

(ii) Indexes to the Directory

  (a) Keyword subject Index

  (b) Project executing organizations Index

  (c) Project leaders Index

  (d) Project Sponsoring/Funding/Collaborating Organizations Index

Thanking you

Yours sincerely

(M.N. SEETHARAMAN)

ANNEXURE-IV

M.N. SEETHARAMAN
IDRC Consultant

Dar Es Salaam
28th July 1993

The Director,
Information and Documentation
Tanzania Commission for Science
and Technology,

Sir,

Sub: **NATIONAL REGISTRY OF SCIENTIFIC INSTITUTIONS IN TANAZANIA**

I have gone through and analyzed the data in respect of 34 S&T institutions for which completed questionnaire have been received by the Commission as on date.

These 34 institutions have been broadly grouped under the following subject headings:-

I	**AGRICULTURAL SCIENCES**	
1.	Agriculture - Development	2 Institutions
2.	Agriculture Research & Training	11 Institutions
3.	Animal Husbandry	4 Institutions
4.	Forestry	4 Institutions
5.	Pesticides	2 Institutions
6.	Veterinary Medicine	2 Institutions
7.	Wild Life	1 Institution
II	**EDUCATION**	1 Institution
III	**ENGINEERING & TECHNOLOGY**	4 Institutions
IV	**MEDICAL SCIENCE**	1 Institution
V	**PHYSICAL SCIENCE**	1 Institution

The following indexes have been provided:-

1. Keyword Subject Index
2. Location Index

The National Registry may be expanded by including data on S&T institutions from the following sources:-

1. Database on ongoing R&D projects in Tanzania(under development)
2. Database on S&T workers in Tanzania(under development)
3. Directory of S&T institutions in Tanzania

Thanking you,
Yours sincerely

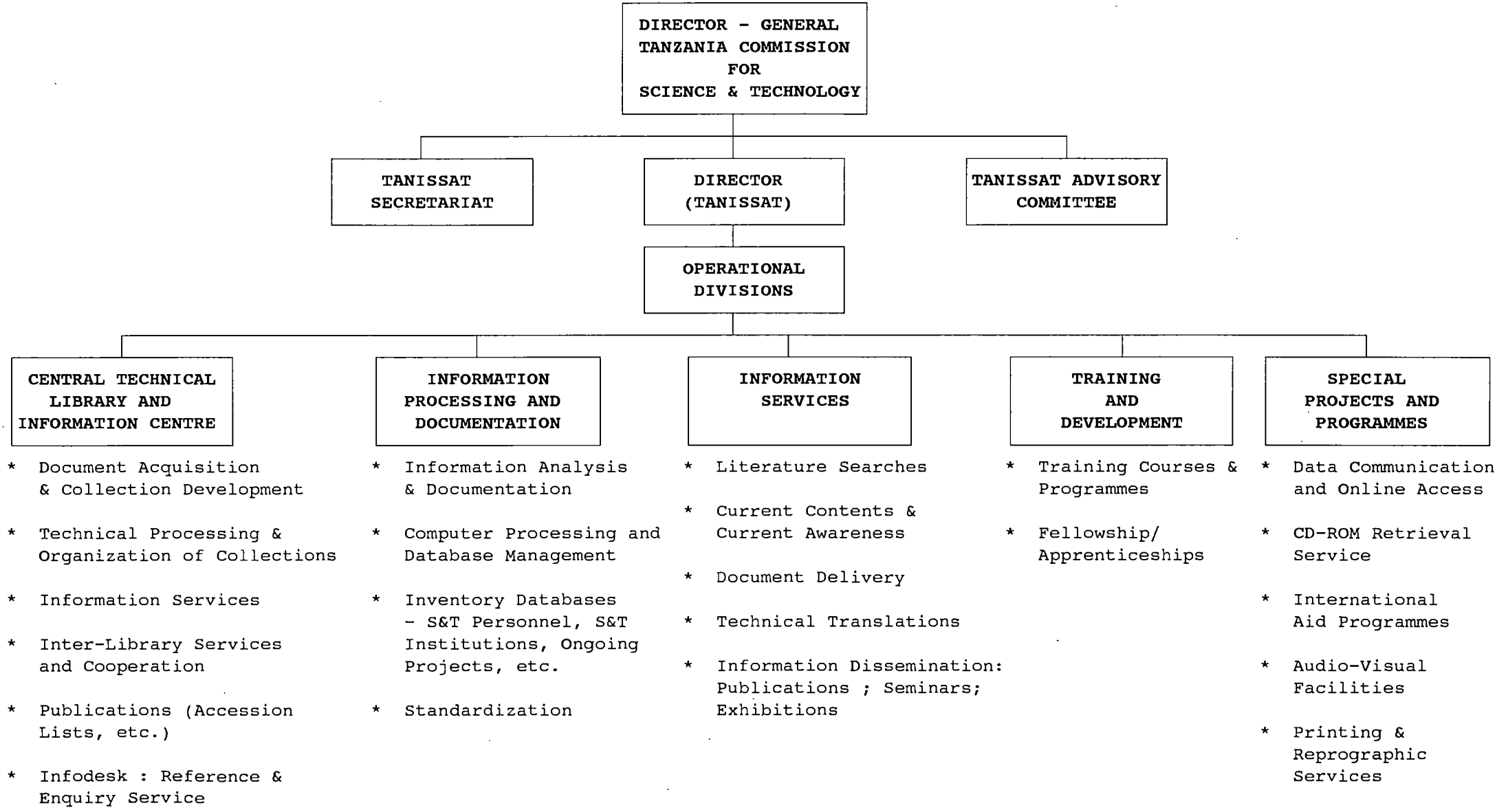
(M.N. SEETHARAMAN)

ANNEX - 7

TANZANIA NATIONAL INFORMATION SYSTEMS FOR SCIENCE AND TECHNOLOGY

(TANISSAT)

OUTLINE OF THE PROPOSED ORGANIZATIONAL STRUCTURE



ANNEXURE-VI

TANZANIA COMMISSION FOR SCIENCE AND TECHNOLOGY

CENTRAL TECHNICAL LIBRARY AND INFORMATION CENTRE

DOCUMENT SUGGESTION

1. **TYPE OF DOCUMENT**

☐	Book	☐	Reprint
☐	Conference Procedings	☐	Standards
☐	Technical Report	☐	Patent
		☐	Others

2. **AUTHOR(Personal)**

3. **AUTHOR(Corporate)**

4. **PLACE, PUBLISHER, EDITION, YEAR, NO. OF PAGES**

5. **DOCUMENT NO., IF ANY**

6. **SOURCE OF SUPPLY**

7. **PRICE**

8. **OTHER DETAILS**

Date :

(NAME IN BLOCK LETTERS)

SIGNATURE

DESIGNATION
DEPARTMENT/ORGANIZATION

ANNEXURE-VII

TANZANIA COMMISSION FOR SCIENCE AND TECHNOLOGY

CENTRAL LIBRARY AND INFORMATION CENTRE

Ref No: Date:

To

Dear Sirs,

Sub: REQUEST FOR SUPPLY OF UNPRICED PUBLICATIONS

The Tanzania Commission for Science and Technology(COSTECH) is setting up a National Information System for Science and Technology(TANISSAT) for the purpose of collecting, organizing and disseminating information to the S&T community in the country.

As part of the national information system, a Central Technical Library and Information Centre(CTLIC), has been set up.

CTLIC is now engaged in building a comprehensive collection of books, journals, technical reports, conference proceedings, dissertations etc., in order to provide access to current scientific and technical information for our scientists and engineers. However, due to constraints in foreign exchange resources, we have not able to buy many publications from foreign R&D centres, Universities and other S&T institutions.

It is in this context that we are issuing this request to you to deposit in CTLIC one copy of each of whatever unpriced publications that your organization are bringing out on a regular basis by including our name in your mailing list.

The publications that are of interest to us are:-

(a) Annual Reports
(b) Technical Reports
(c) Conference papers
(d) Reprints of papers published by your faculty and staff in international journals
(e) Dissertations
(f) other unpriced S&T publications

We shall be grateful to you for your co-operation and assistance in this matter.

Thanking you,

Yours sincerely,

ANNEXURE - VIII

TANZANIA COMMISSION FOR SCIENCE & TECHNOLOGY
CENTRAL TECHNICAL LIBRARY AND INFORMATION CENTRE

MEMBERSHIP APPLICATION

I wish to apply for Membership in the Central Technical Library and Information Centre.

Please enrol me as a Member and issue me with borrower's tickets to enable me to make use the Library's resources and services.

Particulars of my profession and employment are given below :

01.	**Name in full**	:
02.	**Designation**	:
03.	**Name of Organization in which employed**	:
04.	**Telephone/Telex No.,if any**	:
05.	**If not employed, details of other avocations(e.g. Students/Self-employed etc.)**	:
06.	**Qualifications**	:
07.	**Areas of Study and Work**	:
08.	**Purpose of Membership**	:
09.	**Residential Address**	:
10.	**Other particulars**	:

I will abide by the Library rules and regulations in force from time to time. I will return all documents borrowed within due date and pay overdue charges for delays and repay the cost of documents borrowed, if they are lost or misplaced or damaged.

Place :
Date :

SIGNATURE OF APPLICANT

The Membership of the applicant is recommended.

SIGNATURE OF HEAD OF INSTITUTION/DEPARTMENT

FOR USE IN COSTECH

1. Admitted as a Member (Roll no.)
2. Borrower's Tickets Issued (Ticket Nos)

SIGNATURE OF DIRECTOR, TANISSAT